CALGARY POWER

RELAY

MARCH 1980

'We're coming 'round the mountain'

CALGARY POWER

RELAY

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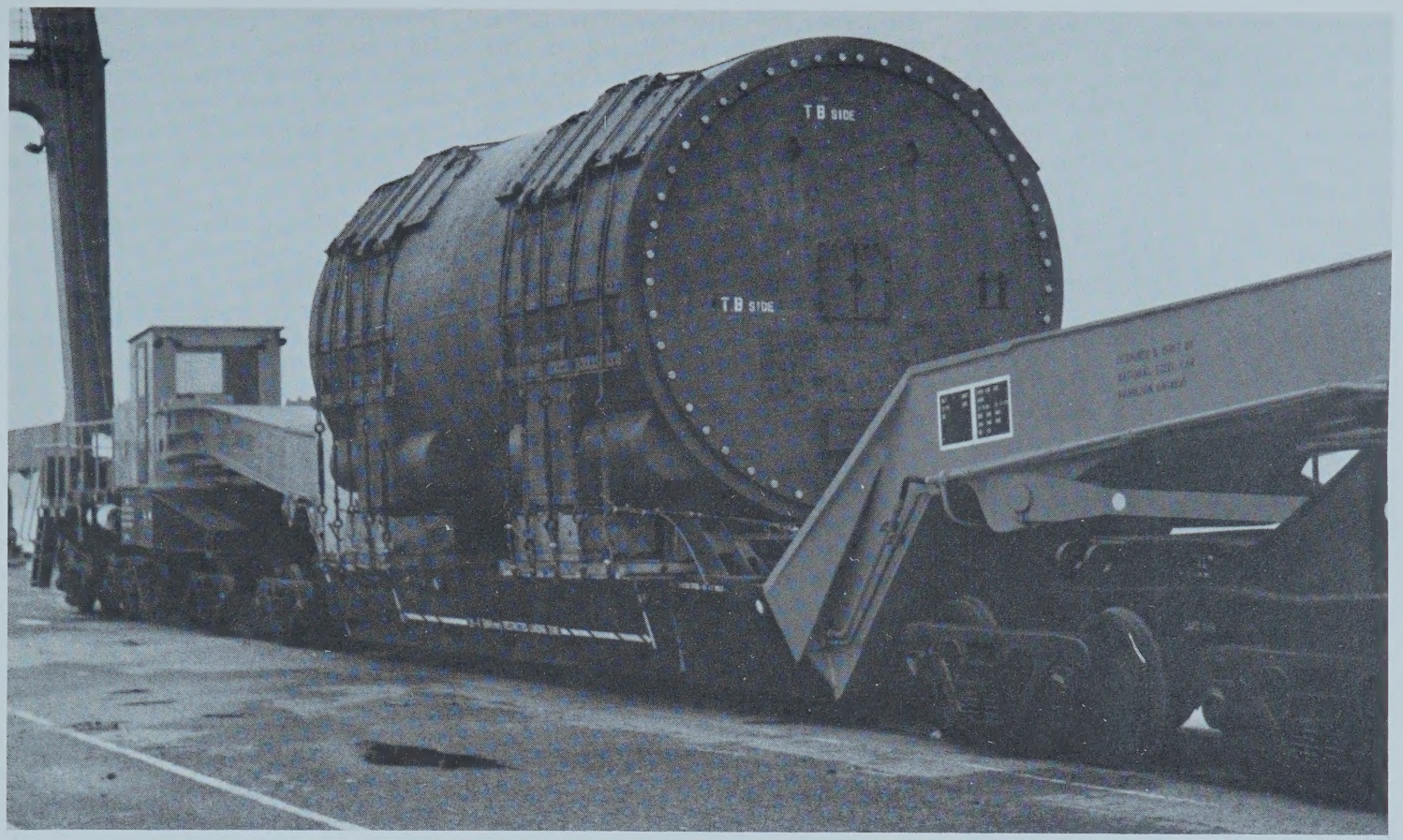
OUR COVER:

A special CN freight train heads east through British Columbia in February, marking Calgary Power's spectacular entry into railroading. The stator for APL's Battle River Plant rides securely on our car, one of the biggest flatcars in North America.



Calgary Power's railcar with the 240-ton stator. Dick Tolg took this photo during preparations for the trip through the Rockies. Tie-down was with cables and turnbuckles.

Million dollar baby — Calgary Power's own

Talking about a company's fleet usually means talking about cars and trucks, with maybe a few specialized off-road vehicles included. Meet Calgary Power's biggest and most expensive fleet vehicle, designed to move gigantic loads over the roads that are made of rails.

The first railcar the company has ever owned, CAPX 1001 is the largest depressed-center flatcar operating anywhere in North America. It cost about $1.25 million, measures nearly four times the length of a standard railway boxcar, and weighs 191 tons without any load.

The car can take a load of up to 400 tons on its central bed, which is 35 feet long. It's designed specifically to carry the stators for our largest generating units and can carry the largest transformers used in our substations. Customers such as oil companies are already indicating their interest in it for moving heavy machinery.

Calgary Power received the car on CN tracks at Sundance Plant in December from the manufacturer, National Steel Car Corporation Ltd. of Hamilton, Ontario. It travelled west unloaded because if it had picked up any load in Ontario for the trip, we would have had to pay a seven per cent provincial sales tax on the purchase price!

A lot of thought went into this project before Calgary Power entered the railroad business. CAPX 1001 is a specialized tool which will solve some serious transportation problems over the next several years of plant construction.

As populations and the demand for electric power have grown, the transformers and generators needed by the utilities have outgrown the railway-owned flatcars available. In all North America in recent years there have been only six or seven cars capable of carrying these huge loads; some owned by suppliers, some by other utilities and only one by a railroad. The maximum capacity available was 300 tons.

Some years ago, A. W. Howard, our Chairman, Bill Fraser, Vice-President, Engineering and Planning, Al Hadlington, Director of Generation Projects Management and Ron Umbach, Manager of Generation Design, began to consider long-term problems and possibilities. As the Company looked forward to 500 kV and possibly even higher transmission voltages, our needs over the next 30 years were clearly outstripping the available equipment.

"These cars could be booked in advance, but then the delivery date for the

equipment we were transporting might change," says Al Hadlington. "Even with firm dates we were having increasing difficulty leasing these cars. We had to send the Sundance 4 transformer back to Westinghouse in Hamilton for repairs; it's a 180-ton unit and we waited nearly six weeks for a car."

Another factor was the very strong possibility that if Calgary Power bought a car, other users would want to lease it. Events proved that assumption correct, and much sooner than we had expected.

Two years in construction

Preliminary work began a few years ago. Ron Umbach gathered information from other utilities and equipment manufacturers as to the size and weight of the units we might find ourselves buying for plants and substations. Senior buyer Ian Richardson checked out potential suppliers and arranged preliminary tenders. National Steel Car, the leading railcar builder in Canada, was selected and started doing some preliminary designs.

A capacity of 400 tons and a bed length of 35 feet were specified. Working with NSC engineers who had done this sort of thing before, our people decided to specify vertical lift and the capacity to shift the car center to either side to improve stability. Hydraulic jacks provide lift up to 12 inches, while other hydraulics and sophisticated bearings can shift the center section up to 14 inches on either side.

The actual order was placed in December 1977. Two years later to the month, the car rolled out of the manufacturer's plant. It reached Lake Wabamun around Christmas after an uneventful trip.

At that point we didn't know when it would make its first revenue trip. Leasing the car to other users involves arranging a rental lease, obtaining railroad clearances and crewing it with people to operate the sophisticated hydraulics in transit.

Meanwhile, Hitachi in Japan was getting ready to ship the 240-ton stator for Unit 5 at Alberta Power's Battle River Plant near Forestburg. Battle River 5 is the next major generating unit scheduled to start up in Alberta after Sundance 6, and it will more than double the capacity of the Battle River Plant.

Hitachi's Canadian agents, the Marubeni trading company, had already leased another car, but encountered problems with its availability. They changed their leasing plans, and in January CAPX 1001 was off to Vancouver to receive its first load.

Out & back in 30 days

This first working trip spanned 30 days. The car left the Sundance siding on January 24th and returned 'home' on February 22nd. Those 30 days cost the customer $500 a day, says Dick Tolg, fleet manager, who is in charge of the unit.

Nothing much happened westbound except a delay caused by a derailment of sulphur cars in another train. On February 1st at Vancouver's Centennial Pier, the car was positioned and a huge harbour crane lifted the stator out of the ship's hold. It took nearly two hours to place the 12-foot-diameter cylinder on the car according to our loading requirements.

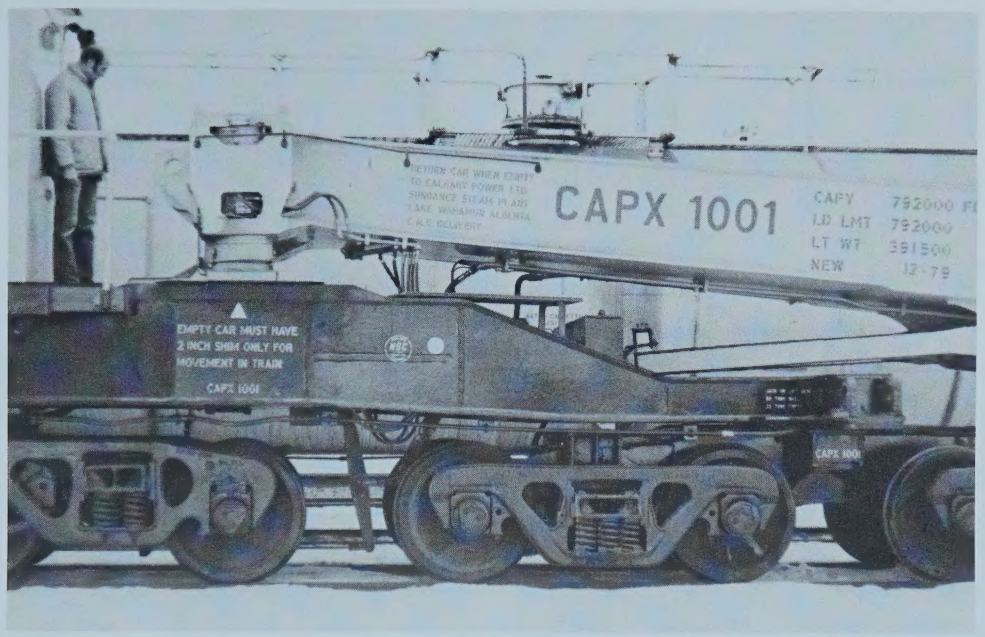
After a quiet weekend, three days were spent blocking the load and tying it down with bolts and cables. It was covered with a polyethylene sheet and chicken wire to keep the poly down. Later on in a tight place, the poly and wire lost arguments with wayside obstructions but car and load were unscathed.

Two engineers from NSC flew out and joined Dick Tolg on February 6th. They helped him check the car thoroughly, fill the propane tanks, test the motors and check out the lift and shift systems.

Meanwhile CN was making up the train consisting of two locomotives, five boxcars of light freight, our car and two cabooses. The forward caboose was home to Dick and the NSC men for the trip. It provided a hotplate and refrigerator, but they didn't have much chance to check out the rest of the accommodations because nobody got much sleep.

Everybody was up and at work by 5 a.m. on Saturday, February 9th. A CN Trainmaster rounded out the four-man crew of CAPX 1001 for the entire trip. The men rode two and two in the control cabs, in touch with each other by radio and with the train crew on another channel.

Ontario Hydro's "Schnabel" car is another way of moving big loads; it's primarily designed for transformers. The car ends provide load lift and shift capacity similar to our car. Transformers are made with reinforced frames and the load is borne by thick pins, just visible at the transformer's lower corners. The unit being carried becomes part of the car and must withstand train stresses during movement. A flatbed center can be added. The Schnabel is also rated at 400 tons.



Ross Baker, Substation Design, examines the huge load-bearing jacks at one end. These jacks ride on horizontal bearings which provide for load shifting to either side. The "reduced pivot" point is closer to the center, where the yoke-shaped beam comes down.

"The railroad people couldn't have been more helpful," says Dick. "There was a tremendous amount of interest in the car and the shipment, and we had the greatest co-operation from them." Seven train crews handled the special train between Vancouver and Edmonton.

"We'd tumble out in the middle of the night, man the train and the car, turn on the floodlights and creep through a tunnel," says Dick. "It really gets interesting when you're crossing a bridge and the ground disappears from under you."

Leaving Vancouver, a red Toyota paced the train, its driver springing out at every stop or slow crossing to take photos. A spy? A competitor? He caught up to them in a CN freight yard and turned out to be an avid railfan getting all the photos he could.

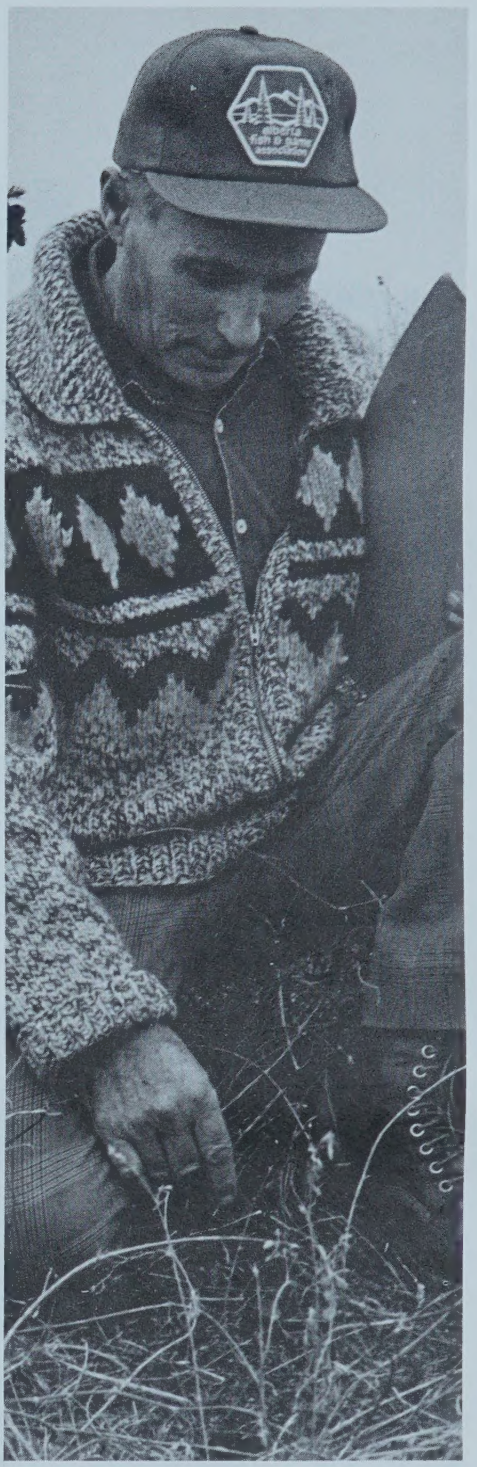
Another view of the car end. The weight of car and cargo travels on 18 axles, nine at each end.

Through Blue River at about 6 a.m. on Sunday and Jasper about noon, the train came through the mountains at an average speed of nearly 25 m.p.h. and reached Edmonton about 1 a.m. Monday. En route they picked up a Superintendent's work car that offered the luxury of a shower.

When the stator was off-loaded onto a flatbed truck in Edmonton, it had its only mishap of the trip. The truck got as far as the highway when there came what one APL engineer described as a "mechanical stress relief" — the flatbed cracked. Up rolled four mobile cranes to park the stator on the road while the truck went off for repairs. The trip resumed later and the stator reached Forestburg without further incident.

"The car operated beautifully," says Dick. "Our only problem was that the locks in the cab doors froze and wouldn't let us in - then they wouldn't let us out. The Marubeni people repeatedly expressed their appreciation for the special care and attention given their shipment, and have already said that they want to lease the car for future shipments."

With so spectacular a piece of equipment and so successful a first run, it looks like Calgary Power is in the railroad business to stay.



Habitat test now in 5th year

The Stony Plain Fish and Game Association annually survey their Habitat Improvement Project at Whitewood Mine, to determine the use being made of the the area by animals and birds and to examine the growth of over 2,000 seedlings planted by members since 1976. Association member Harry Scheidemann examines a seedling during the survey last fall.

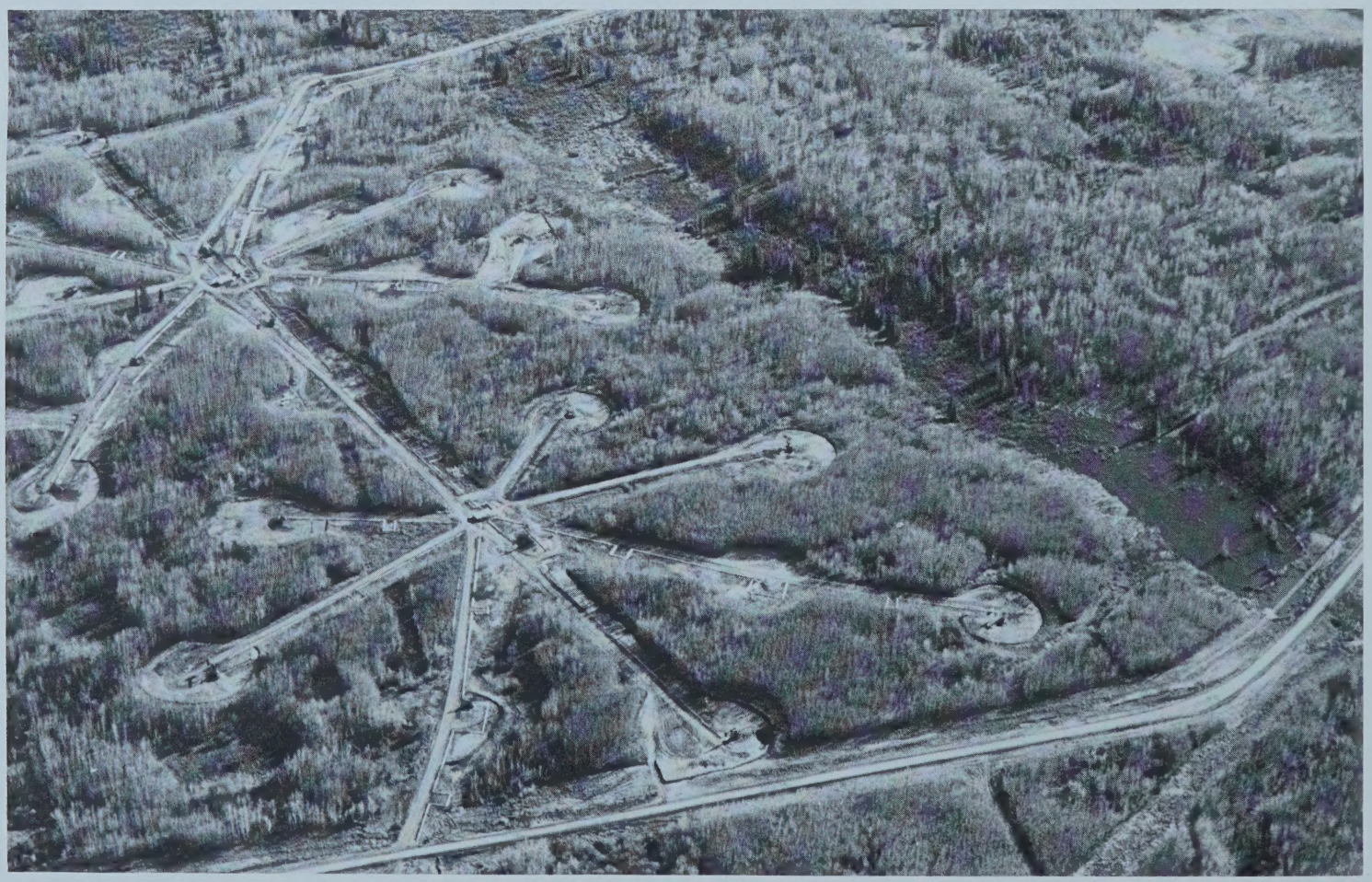
Steam injection and producing wells marked by 'horse-head' pumps at Cold Lake.

Everyone's ready

Esso Resources is ready. The testing that began in 1964 with four small wells in the Cold Lake region of northeastern Alberta in 1964 has led to that company's proposal for a $7 billion plant to extract oil from oil-bearing sands.

Calgary Power is ready. Our people told the Energy Resources Conservation Board in recent hearings that Calgary Power can best serve the energy needs of the vast Cold Lake project.

Alberta Power has opposed our application to serve the project in northeastern Alberta, claiming that it must be given this opportunity to expand. APL



Drilling pads have little environmental impact and create a snowflake-like pattern from the air.

to go on $7 billion Cold Lake project

told the ERCB that they have only 15 per cent of the Alberta customer market.

But Esso Resources is on record as favouring our application for the service area, and another set of hearings will be held by the ERCB to discuss possible transmission line rights-of-way. At this writing, no date has been set for those hearings, pending the ERCB decision on applications to serve this major load.

At stake is what could become the largest electrical load in the province outside the cities of Edmonton and Calgary. The Cold Lake oil extraction plant is scheduled to be in operation by 1984 and will require up to 190 megawatts by 1989.

In testimony before the ERCB, President Marshall Williams said that only CPL could provide the reliability and stability of supply which the Esso project will need and could do so at the lowest cost to the customer. CPL has higher generation capacity and transmission distances to Cold Lake would be less for us than for APL.

Meanwhile, Esso continues detailed engineering studies to support its plans for Cold Lake.

Ted Courtnage, Esso's project executive, says that Cold Lake will be one of the largest projects ever undertaken by the private sector in Canada. It will require an estimated 7.5 million man-hours of engineering and 50 million man-hours of trades labor to construct the plant and related facilities.

For the investment of $7 billion, Esso will be able to produce 22,500 cubic metres of oil a day from sands that lie 500 metres underground, or about 141,000 barrels. "Steam stimulation" will be used to recover the bitumen from underground strata without mining it. At the plant, gas and water will be separated and the bitumen recovered in two stages of treatment.

A director of Calgary Power for 26 years dies

Denis Stairs, O.B.E., M.C., a prominent consulting engineer and a former Director of Calgary Power Ltd., died in Montreal in January at the age of 90, ending a distinguished professional career that spanned nearly 60 years.

Mr. Stairs joined Montreal Engineering Company, Limited, in 1922 and was an active member of the firm until his death. He served that firm as chief engineer and as vice-president, and was Chairman of the Board from 1964 to 1973.

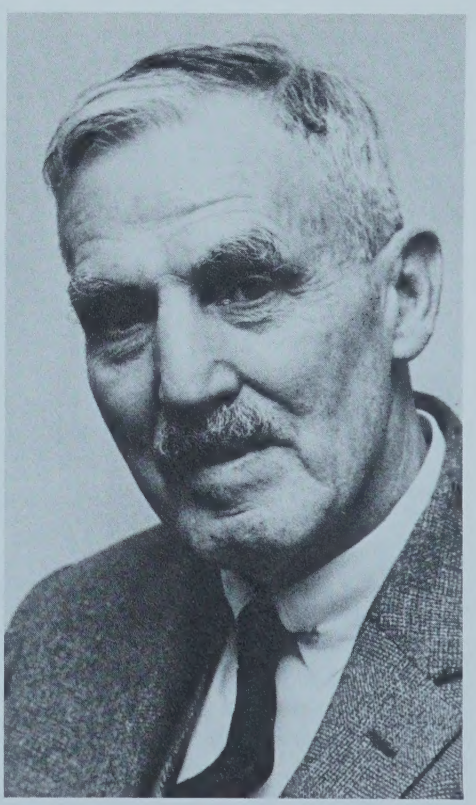
He saw active service with the 25th Battalion in France in World War I, was twice wounded, and received the Military Cross. In World War II he served as Director-General of Defence Projects Construction in the Department of Munitions & Supply under the late C. D. Howe. In 1943 he was appointed Deputy Power Controller. For those services he received the Order of the British Empire.

During much of his career he was involved in managing electric utilities. He was Director, President and Chairman of Newfoundland Light & Power Co. Limited and a predecessor company; Director, President and Chairman of Maritime Electric Company, Limited; and Director of Calgary Power, Nova Scotia Light & Power Company Limited, Avon River Power Company and Ottawa Valley Power Company.

He also brought Montreal Engineering into activities which led to participation in power developments in the Yukon and the Northwest Territories, as well as in Quebec for the pulp and paper and iron ore industries.

In the 1950s Mr. Stairs made significant contributions to the Colombo Plan, forerunner of the Canadian International Development Agency. He provided guidance for two major hydro-electric developments in India and technical assistance to Burma.

His contributions to Canadian engineering were recognized with the award of an honorary Doctor of Engineering degree from Nova Scotia Technical College in 1948 and an honorary Doctor of Laws degree from Dalhousie University in 1954.



Denis Stairs

Simulator gives 'real' experience

The instructor helps students to relate simulator functions to actual plant operations.

Computers aren't usually valued for their ability to make mistakes. But up at Sundance recently, there was a busy computer on trial that could make 2,500 plant functions go wrong, 10 of them simultaneously.

No, we didn't get a lemon. The unit was a generic model of a 600 megawatt power plant; a simulator to give our trainee operators first-hand experience on a thermal plant control panel.

Designed by Combustion Engineering, the simulator was rented for a six-week trial period to see what potential and possible applications it might have for the plant's growing training program.

Training supervisor Allan Hantelmann said that the simulator's primary role is to give the operator 'hands-on' experience during training, without risk to the physical plant systems.

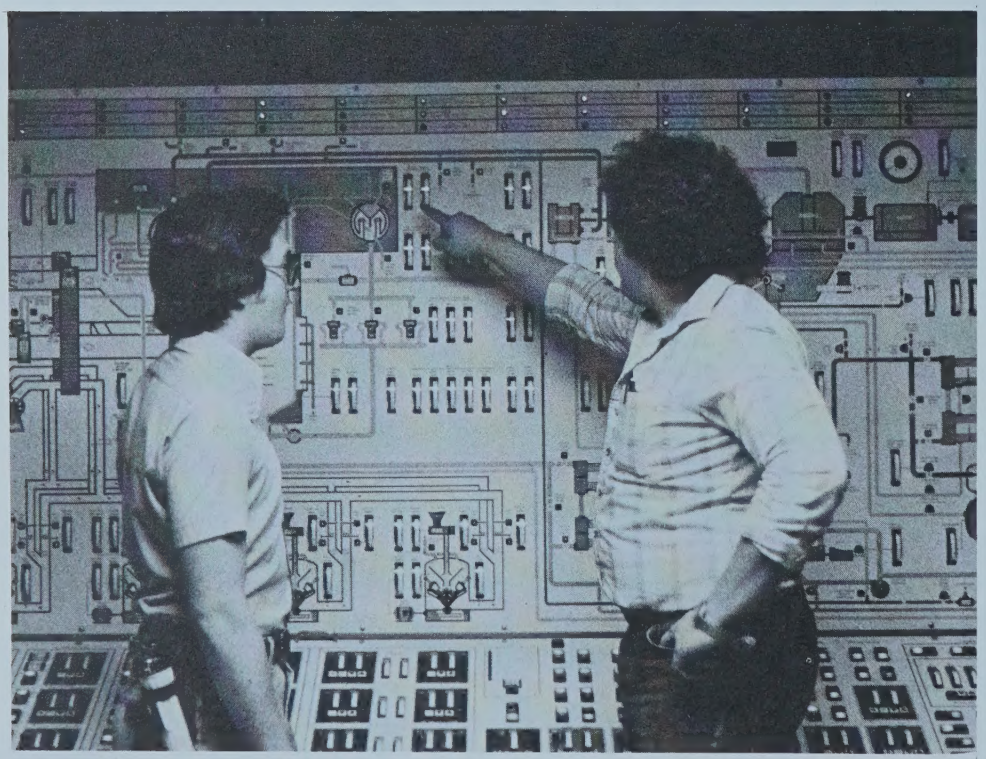
"The unit is designed to simulate various malfunctions and to respond to corrective measures in the same way a real plant does. If you make a mistake correcting a malfunction on the simulator, the result of your error is apparent when other systems on the unit come into alarm," Allan explains.

"Its a good way to train people in how to think on their feet, to help them develop a reflex response to trouble in the plant. As a realistic model, it also helps them to understand how all of the plant's systems fit together in the production of power."

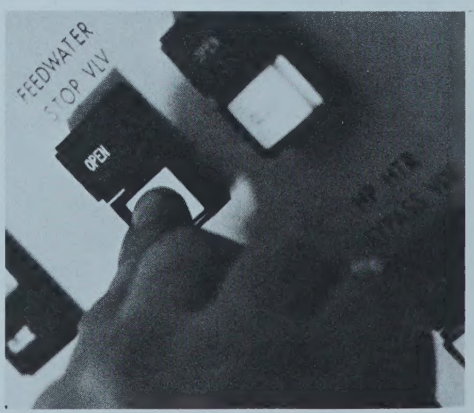
Allan says a good instructor is vital in any effective simulator training program. "The instructor guides the operator through the initial understanding of how the systems function and later, by questioning the trainee's reasons for performing certain measures, an understanding of their interdependence in the plant's operation."

"We've had a real variety of visitors from other Western Canadian and American utilities come to observe and try the unit," Allan says, "it's quite a conversation piece."

During the six-week trial period, various plant staff people used the unit, including supervisors from other areas of the plant's operation. Each was asked to provide a brief critique to assist in evaluating its effectiveness as a teaching model.



Bryce Heartwell, left, goes through the steps of using the power plant simulator with Allan Hantelmann, Sundance training supervisor.



The simulator provides hands-on experience for trainees.

On the pole, from top, are Norbert Kilroe, Gord Leyland and Tom Niefer.

Spurs no use on steel pole

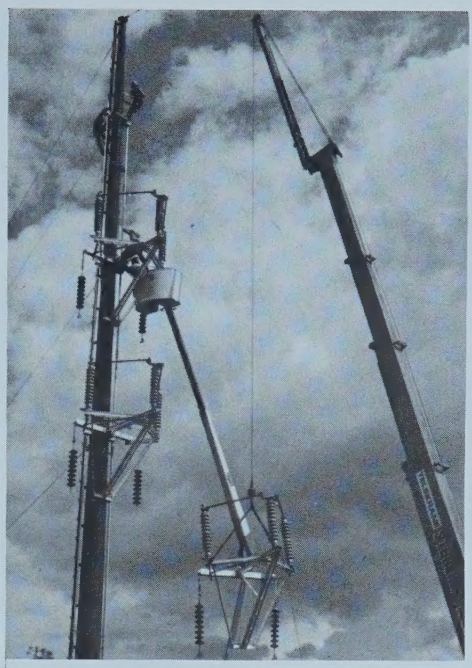
Where we've used vertical air-breaks before they've been mounted on triangular aluminum towers, but at Shell's Jumping Pound compressor station, greater height and clearance were needed.

A 100-foot steel pole 44 inches in diameter was locally designed and produced in Calgary. Getting it trucked to the site was almost the hardest part of the job.

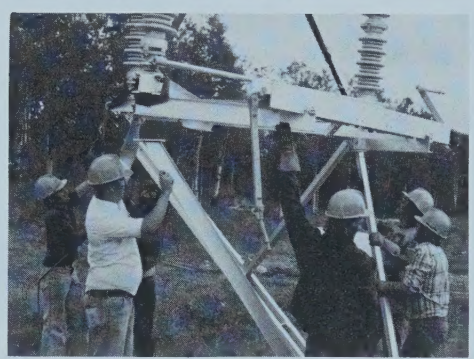
There it was positioned on a 48-inch base that goes nearly 12 feet into the ground. Anchor bolts were smeared with epoxy grout and the pole lowered into position with a 30-ton hydraulic crane, after which the three-phase air-breaks had to be installed and connected up at the top.

Erv Saunders' construction crew did the job. John Yeo of Transmission Design took the pictures.

Brian Erdman and Erv Saunders smear epoxy grout on anchor bolts.



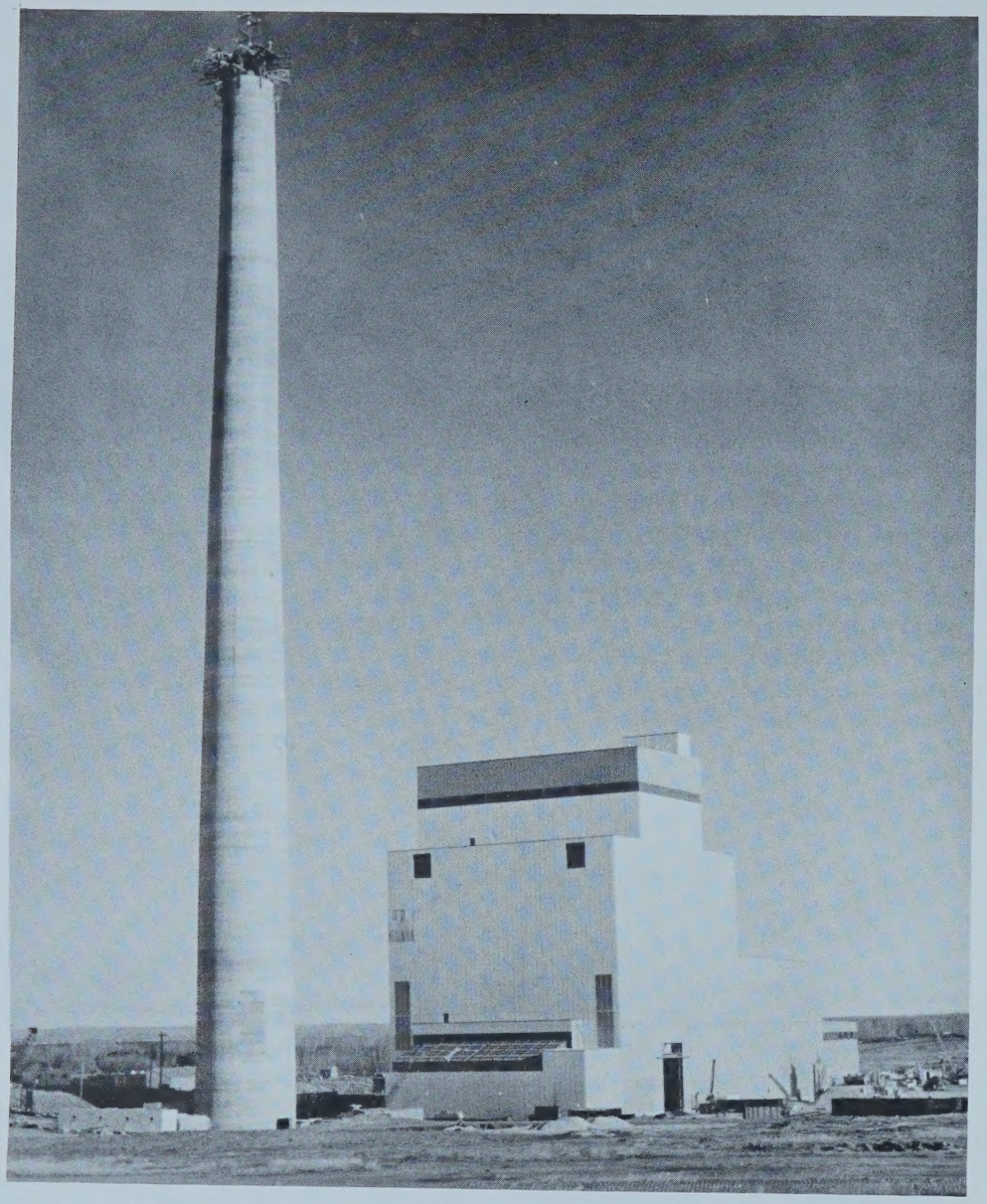
Reaching out from the bucket to help is Clay Wagner as top breaker goes up.



Ken Lyster and Erv Saunders direct preparations for the air-break's lift.

As crane swings pole into position, all hands are ready to manoeuvre it.

This only looks like a bunch of bums. Everyone pitches in to position the pole base correctly on the pad and anchors.



Back in 1970, our giant Sundance plant didn't yet look like much.

Before Bighorn started up in 1973, massive Lake Abraham had to fill.

The 70s, for Calg

What happened to **us** during the Me Decade?

If your job doesn't involve taking a long view of company growth, it's a good bet you'll find it hard to believe. Since the start of the 70s, Calgary Power has:

- almost doubled its staff — from 1,140 to 2,166 — and quadrupled its long-experience component (members with 25 years or more on the job numbered 77 at the end of 1969 and 308 as we embarked on the 80s).
- more than doubled its annual energy sales, from 5,219 million kWh in 1969 to 11,794 million in 1979. Peak load climbed from 950.9 to 2,123 megawatts.
- added 1,748 megawatts of generating capacity (1,628 in five units at Sun-

What's ahead in

Though long-range load forecasts are somewhat lower now than in the mid-70s, it's still safe to bet that we'll have to double our generating capacity in the next 12-14 years.

During the 80s, Sundance 6 will be next on stream, followed by Keephills 1 and 2 in 1983-84. Next, we are almost certain to add 50 per cent of Alberta Power's Sheerness plant through a joint ownership agreement. Sheerness 1 and 2 are to come on stream in 1985-86. After that, we've applied for Keephills 3 and 4.

That means Calgary Power will add the equivalent of six 375 MW units, or 2,250 MW to its present 2,197 MW thermal capacity, in the 10 years ahead. On the hydro side, development of hydro capacity at the Dickson Dam (Site 6 on the Red Deer River) where Alberta Environment is building a flow-control facility is most likely in the near future. Its "firm 4 MW" could add a theoretical 8-10 MW to our present 800 MW hydro capacity, bringing CPL's total by 1990 to something over 5,250 MW.

Other developments now under government study are the Dunvegan site on the Peace River, Mountain Rapids on the Slave and even a DC link with

y Power, were 10 years of vast growth

dance and 120 at Bighorn) more than doubling our 1,249-megawatt total capacity at the start of the decade.

- almost quintupled its investment in land, buildings, plant and equipment (less accumulated depreciation), from $289 million at the end of 1969 to $1.47 billion at the end of 1979.
- issued more shares in the company than in its first 60 years since incorporation (5¼ million common shares grew to 12½ million, while preferred shares as a percentage of our capitalization ratio doubled). Total shareholders' investment climbed from $103.9 million to $746 million.
- increased annual capital expenditures from $40.9 million to $209.1 million. Next year's capital program is budgeted to cost $325 million.

If these dollars look lavish, it may help to remember they're now worth less than half the 1970 dollar's value. It's something to keep in mind, when you study these changes:

- revenues increased from $49.9 million to $311.9 million and operating expenses from $15.2 million to $69.4 million, while taxes went from $9.9 million to $71.6 million.
- the dividend per common share went from 80¢ to $2.50, earnings from $1.76 to $4.75, and the average cost of power per kilowatt hour went from 1.06¢ to 2.62¢.

Colour TVs, dishwashers and no-frost refrigerators were big sellers in 1969. You could buy a new car for $81 down and $81 a month.

Given the millions of man-hours the company has spent in this decade preparing for and presenting its case at regulatory hearings, it's hard to believe that at the start of the 70s we had no experience in them at all. Not until June 1, 1971 was the Oil and Gas Conservation Board renamed the Energy Resources Conservation Board with responsibility for administering the Hydro and Electric Energy Act. And until the late 60s Calgary Power was reducing its rates.

The environment was being paid attention — plans for Sundance included a 510-foot stack and mechanical precipitators, reclamation of mined lands was following in due course — but more elaborate and expensive equipment and procedures were as yet unknown.

What a difference 10 years makes . . .

e 80s? Who can say for sure?

Manitoba Hydro's Nelson River plants, being called a first step toward a western grid.

With or without the western grid, CPL expects to take its first strides into 500-kV transmission during the 80s. Two lines from Keephills to Ellerslie and one from Calgary to Crowsnest Pass have already gone to public hearings before the Energy Resources Conservation Board.

Appeals and interventions hampered right-of-way acquisition for transmission lines during the 70s, slowing some lines' in-service dates by years. While utilities in other provinces are increasing their revenues through export sales of electricity, and utilities in the Pacific Northwest hadn't enough water to meet hydro load requirements this winter, Calgary Power is evaluating the merit of applying to the National Energy Board for an export license. Opponents of our proposed 500-kV B.C. Tie argued that the line was only needed for this purpose, which might have seemed plausible to people who aren't aware of reserve sharing and emergency supply requirements of the system.

On-site generation, now about 500 MW in Alberta, will likely increase proportionally faster than interconnected capacity, as more mega-projects on the scale of Syncrude, for example, come on stream. Also, waste heat from other industrial processes could be used for more and more power generation during the 80s.

Security of service in the south of the province will be improved with the addition of the Sheerness plant and by interconnections with APL's facilities at Battle River and with our transmission system near Brooks.

Community participation in the planning process, which got its start in Calgary Power late in the 70s, now has its procedures in place — and is likely to be even more influential in future. Arrangements for the relocation of the hamlet of Keephills are taking shape, well ahead of the proposed date for mining, so that it can retain its character as community centre of the district.

Maybe the 80s will be the decade in which we'll turn out to have solved all our problems. Wanna bet?

Long-range forecasting is risky. Back in 1958, Relay carried an analysis of the art by a young Marshall Williams. He quoted from the provincial government's submission to the Gordon Commission a load forecast for 1955-1985. "We do not necessarily agree in detail with this forecast," he said . . . wisely.

The forecast electric load for 1980 was 6,616 million kWh for the province as a whole, and 4,520 million kWh for Calgary Power. In fact, last year they turned out to be 19,928 million kWh provincially, and 12,847 million kWh for Calgary Power in 1979.

Though the Electric Uility Planning Council's 30-year forecast looks high to conservation-minded critics of the industry, it's probably only realistic.

How we helped fight fire at St. Albert Inn

About 3 o'clock in the morning February 21, guests at the St. Albert Inn were phoned and told to get out of the building. The whole ground floor was on fire.

The fire, which started in a lounge, was raging inside concrete and steel walls. Roofs caved in. But the tower where 50 guests had been sleeping did not burn.

As the guests stood watching, it was clear to one of them — Calgary Power's Construction Manager Gary Steeves — that firemen on the St. Albert Fire Department's pumper trucks couldn't see where they were training their hoses, into the space within the ground floor walls. Would one of our aerial trucks be a help?

RCMP on the scene, taking their cue from Gary, gave Transmission Construction Supervisor Vance Carter a call. He and Assistant Lineman Wayne Mercier both arrived on the scene — Wayne with the aerial truck. Two firemen climbed into the bucket and were hoisted only a little way up — the radial arm can reach 70 feet. But that little bit was enough to let them see what they were doing.

That didn't solve all the problems, though. Water from the hose nozzle kept running back into the bucket. Each hour or so, the bucket had to be lowered and emptied out. Otherwise, the weight might have wrecked the lifting mechanism.

"Wayne was on the controls," Gary said. "Vance had been a volunteer fireman for years, so he sort of supervised. And I watched . . ." In time, both City (of Edmonton) and County firetrucks arrived and by 8 a.m., Gary said, there was nothing much more for our truck to do — though the cinders were still being doused that afternoon.

Our boys went for breakfast. And within days received a heartfelt thank-you from St. Albert's Fire Chief George Todd.

Glad to be of help, Chief.

District Manager Arnold MacKenzie, left, Jim Drynan, Sherwood Park operations supervisor, and Harold Stein, assistant district manager, at the fire scene.

Thorsby office razed by fire

Arson was suspected as the cause of the fire which destroyed Calgary Power's Thorsby District office building on November 22nd.

The fire was discovered at 2:30 that morning. There were no trucks inside the building. A Tel-E-Lect truck from the McGregor contracting firm, standing outside, was moved to safety.

All the files, meters, tools and other equipment and furnishings inside the building were lost. Fortunately the District staff was able to find temporary office space very quickly in the town's business area and to resume normal operations with minimal interruption.

The RCMP investigated the fire which destroyed Thorsby District office on November 22nd.

Lacombe, St. Albert in full swing

The nine district and two waterworks staff members at Lacombe are well settled in this new office, which opened late last year. The 60 by 100 foot building is also headquarters for a four-man Distribution crew.

Transmission line maintenance in St. Albert involved quite a muster of vehicles when Tim Buttle snapped this photo last fall. From left: the Foremost Delta Three, a tandem Chev with insulated boom, a tandem Chev with a digger, a Mack with Cascade lift, a one-ton Chev, a smaller Chev, a Ford Supercab and a Bombardier tracked vehicle.

Plans discussed at Keephills Open House

Consultant Leo Kyllo, right, discusses a suggested plan for a new hamlet of Keephills with some of the Keephills residents who attended the Open House.

During the Keephills Open House held last December 5th, CFRN News interviewed Garry Prokop, projects representative in Public Affairs. The Open House was held to show Keephills residents the details of three concepts for the new hamlet of Keephills which have been developed by Calgary Power's consultants.

Nuclear Seminar looks at future

The role of nuclear energy past, present and future came under thorough discussion during a one day seminar in Calgary, January 14th.

Calgary Power organized the seminar and invited a number of highly-qualified guest speakers and guests from other utilities, government, the business and educational communities. The meeting was chaired by W. L. Fraser, Vice President of Engineering and Planning, with Board Chariman A. W. Howard, welcoming the 40 or so delegates.

Subjects on the agenda ranged from Three Mile Island and the Candu reactor to nuclear waste disposal sites. Speakers came from the Whiteshell Nuclear Research Establishment in Pinawa, Manitoba, the Atomic Energy Research Council, and Monenco Ontario Ltd.

One of the more topical subjects discussed, understandably so, involved the incident about one year ago at Three Mile Island. W. T. Hancox, Director of the Applied Science Division at Whiteshell, described it as "a minor equipment failure that resulted in a serious accident due to inappropriate operator action." Contributing factors included deficiencies in operator training, lack of clarity in operating procedures and deficiencies in plant design, he said.

The Whiteshell scientist added, "There are important differences in design between the Canadian Candu reactor and those at TMI." He said these differences protect the Candu from TMI-like failures. All safety systems are designed to be independent of each other to ensure that a single initiating event cannot cause a multiple failure.

Other speakers commented on Canada's objective of energy self-sufficiency by 1990. Canada is already almost totally self-sufficient in electrical generation, and nuclear energy can ensure that we remain so.

Dr. R. G. Hart of Whiteshell said that nuclear energy could provide up to 40 per cent of the electric energy needed in an energy self-sufficient Canada.

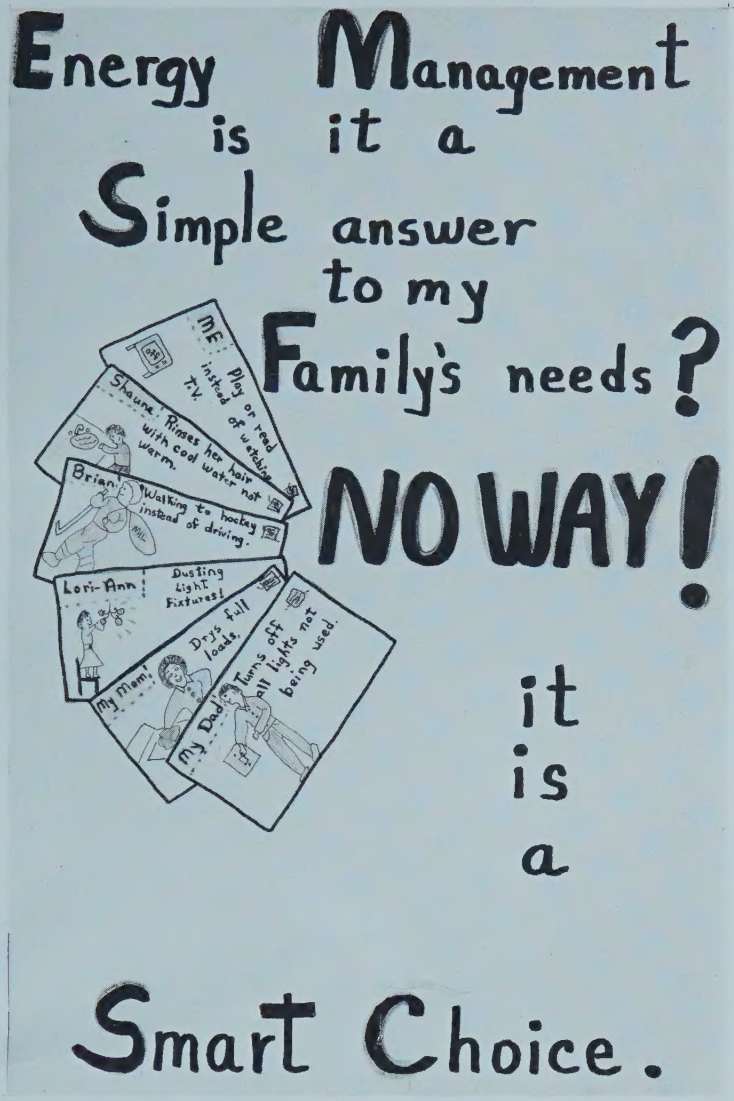
Ten per cent of the world's total energy is now provided by nuclear power stations. Ontario Hydro met over 30 per cent of its electric energy demand in 1979 with nuclear power. There are 12 nuclear units under construction in Ontario and one each in Quebec and New Brunswick. It is not expected that Alberta will consider nuclear energy until the turn of the century at the earliest.

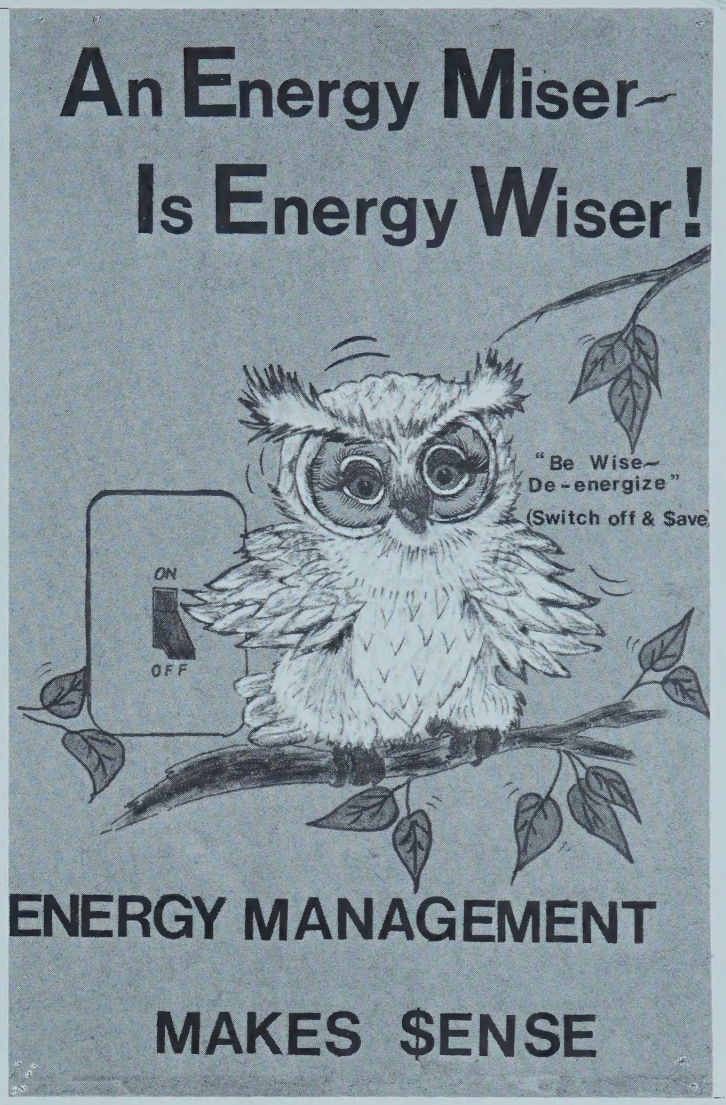
Comments were also made at the seminar regarding disposal of nuclear waste material. At the present time, nuclear waste is held in temporary storage, mainly in Ontario.

S. R. Hatcher of Whiteshell said amounts of nuclear waste are so small that one underground facility such as an abandoned nickel mine would be adequate for handling all the nuclear waste generated in Canada over the next 50 years.

Importance was also placed, during the seminar, on communicating the nuclear message in plain simple English.

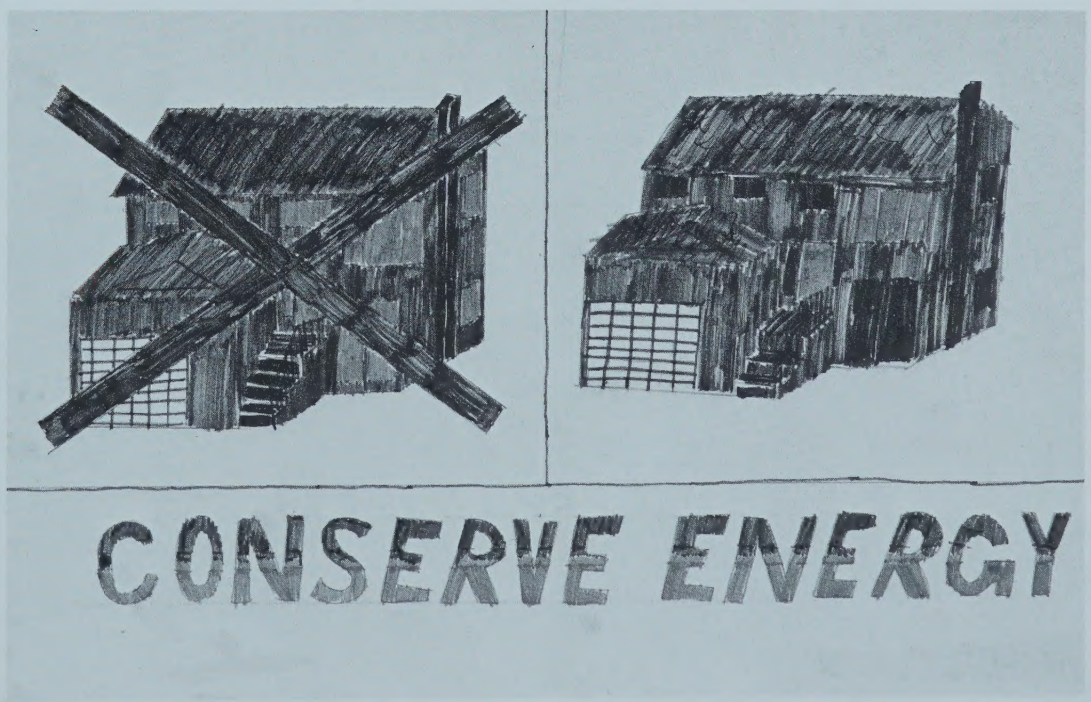
Scientists at Whiteshell have 50 people ready to speak to interested groups. They receive two requests for speakers each day. One of the latest requests would involve a debate on nuclear energy with China Syndrome star Jane Fonda. In the words of one of the speakers, "We have to be prepared to meet with the public and explain the nuclear picture to them."





CPLers' kids 'pedal' energy saving's rewards

These posters won the 1st and two 2nd prizes - a 10-speed and two 5-speed bicycles - for children of Calgary Power families in a recent competition sponsored by Energy Management Services. Top left; some good suggestions on saving energy won 1st prize for Brent Pasula, son of Drayton Valley District Manager Merv Pasula. A wise old owl earned a 2nd prize for Joe Bergman, 9-year-old son of Bill Bergman, Substation Design, Calgary. The 'before-and after' home poster earned the other 2nd prize for Mike Lenz, 11, son of Bill Lenz, Drafting, Calgary.



Windmills get another whirl

John Letal's Calgary-based crew braved a "howling snow storm" in February to install a prototype wind generator at Keith Clayton's farm near Strathmore. Wind is one thing that is plentiful in Southern Alberta.

The windmill, developed by Larry Peterson with the help of a National Research Council grant, would be available to interested farmers for about $7,500 if the Strathmore test is a success.

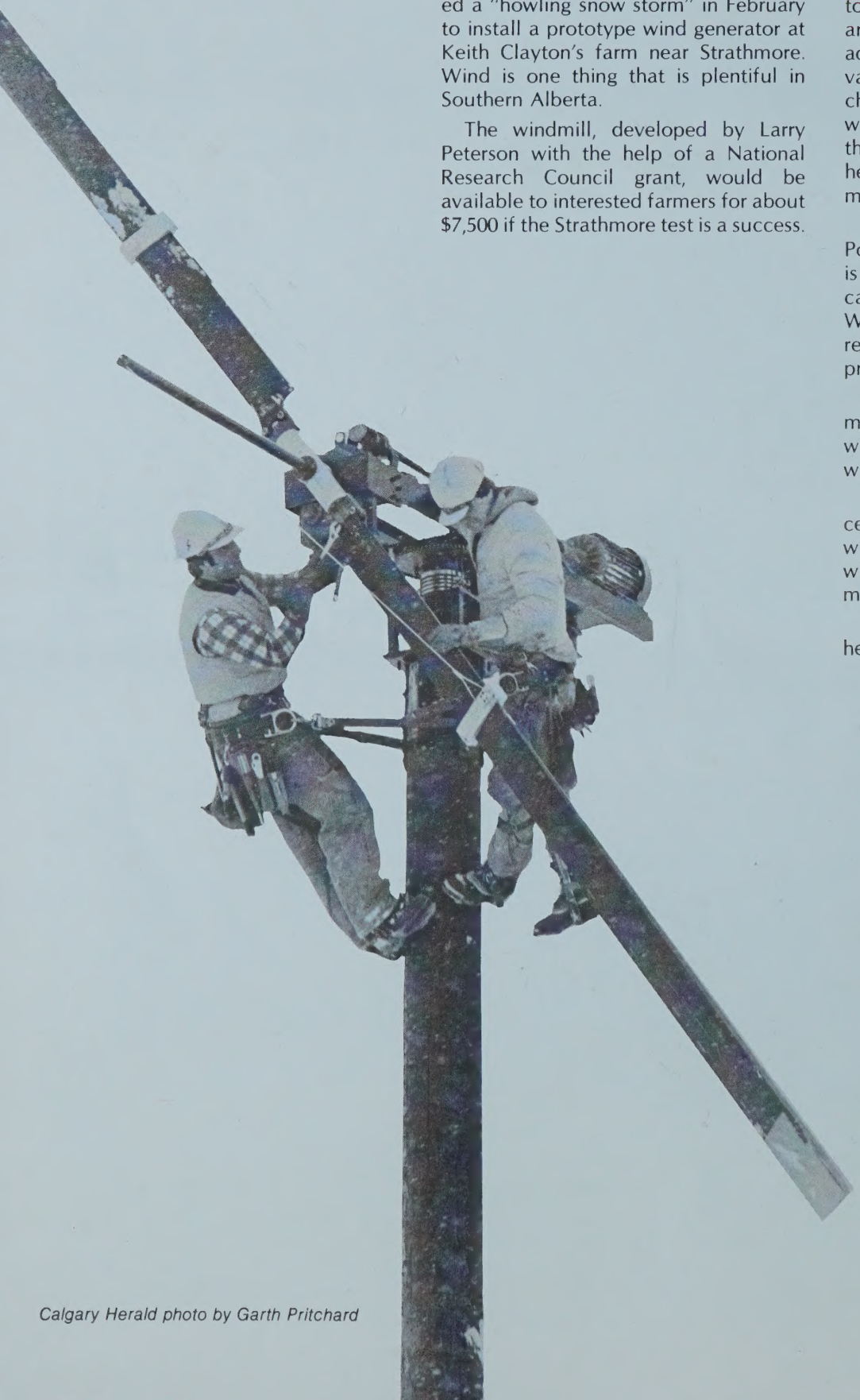
A 20-mile-an-hour wind is all it takes to get maximum power from the unit. and if wind speeds are too high, it self-adjusts to avoid damage. Instead of a vane to turn it as wind direction changes, it adjusts electronically. The windmill's four-metre blades are, in fact, the recycled rotor of a now defunct helicopter and the whole assembly is mounted on top of a 15-metre pole.

The generator is tied in to Calgary Power's system so that when its output is more than the Clayton farm needs it can feed electricity into our system. We're monitoring its generation to get reliable data on how much energy is produced (and how reliably) per unit.

When the windmill is connected to a meter, it would run backward when windpower is fed into our lines, but forward when we supply electricity.

The company has two major concerns: synchronization of the wind unit with our system, and making sure the windmill shuts down when workers are making line repairs.

The two brave linemen at poletop here are Al Julien and Brad James.



Calgary Herald photo by Garth Pritchard